

# The influence of municipal expenditure on the general quality of basic education in Brazil

Fernanda Santana Ramos<sup>1</sup>, Fernanda Maria de Almeida<sup>2</sup>

<sup>1</sup>Undergraduated in Administration Studies, Federal University of Viçosa, Viçosa, Brazil.

<sup>2</sup>DSc in Applied Economics, Federal University of Viçosa, Viçosa, Brazil.

**Abstract—** This study aims to analyze the contribution of the total expenditures committed by the Brazilian municipalities in Infant, Primary and Secondary Education in the general quality of basic education in these municipalities. A Multiple Regression Model was used by means of descriptive and quantitative analysis to estimate the relation between total municipal per capita expenditure and the results of the FIRJAN Municipal Development Index - IFDM-Education. A total of 5.415 municipalities were analyzed in the period from 2005 to 2013. The model as a whole and the variables used (education expenditures in each Brazilian region) were statistically significant, also indicating that 61,62% of the variations in the Education-IFDM were explained by changes in expenses. The results obtained also showed that the Brazilian region whose expenses contribute most positively to the quality of education is the South, followed by the Southeast, Midwest, North and Northeast. Over the years analyzed, it was also possible to notice the evolution of the increase in the expenditures committed with Brazilian education, favoring, in a general way, improvements in the results in the IFDM- Education of the municipalities. Thus, it is possible to conclude that the expenditures committed in education by the municipalities must be continuous. In addition, attention should be paid to the lower efficiency of these expenditures for the North and Northeast regions, since different factors can influence this efficiency and also, directly, the quality of municipal education itself.

**Keywords—** Expenditure, Municipalities, Quality of Education.

## I. INTRODUCTION

Education in Brazil was extolled as a right for all citizens only with the promulgation of the Federal Constitution in 1988, in order to achieve the full development of individuals, preparing them for the effective exercise of citizenship and due qualification required by the market [1].

In order to guarantee the quality standard of Brazilian education, it is organized in a collaborative regime, with the Union responsible for managing and financing federal public institutions, ensuring equalization of educational opportunities, as well as the minimum standard of quality of education for students. States, Federal District and Municipalities guaranteeing them technical and financial assistance [1].

The quality of public education is a global concern, not being restricted to underdeveloped countries, which mostly have education with precarious conditions, high rates of illiteracy, school dropout, age-grade distortion and a high number of children and adolescents outside the

classroom class [2].

Education when developed universally, fully and with quality becomes responsible for reversing the vicious picture of social ills, providing improvements in the country's economic development. In this way, there are countless studies carried out in Brazil and abroad in order to ascertain the quality of public teaching through the expenditures invested by governments [3].

In general, the studies analyze education, from the perspective of quality and public spending committed at regional and national level. With reflections that emphasize that education requires primary attention in the face of state investments, as this is responsible for promoting citizenship, social justice, increasing the level of well-being of the population and economic development, thus guaranteeing benefits for society as a whole.

Although the literature covers different studies related to the quality of education in Brazil, there are gaps in terms of interregional differences. From this, considering

that Brazil is a country with significant regional socioeconomic heterogeneity, as well as the importance of basic education, this study starts from the following question: What is the influence of municipal spending on the general quality of Brazilian Basic Education? Do these expenditures have a different influence on the quality of education in the regions of the country?

Thus, it aimed to investigate the contribution of total expenditures committed by Brazilian municipalities in Early Childhood, Elementary and Secondary Education in the general quality of basic education in these municipalities, as well as investigate the interregional differences in these contributions.

The study is justified, because "if education alone does not transform society, without it, either, society changes" [4]. Therefore, studying education and the efficiency of spending committed in the area of education helps to understand the quality of education offered, which causes changes in society.

This study is relevant for contributing to the theoretical assumption that the quality of basic education is a factor responsible for enabling Brazilians to be able to socially participate as well as positively impacting the level of well-being of Brazilians, contributing to economic and social development. Thus, it is necessary for education to be the object of state attention in order to become the driving force for changes in society.

## II. LITERATURE REVIEWS

### 2.1 Brazilian Education

Education as a human right was envisaged in 1948 through the Universal Declaration of Human Rights formulated at the General Assembly of the United Nations – UN [5]. The declaration aimed to ensure that each individual and body of society endeavors to promote the rights and freedoms contained in the declaration through education.

Thus, the Declaration in its article 26 emphasizes that every citizen must have access to free and compulsory education at fundamental and higher levels, aiming at full human development, "guaranteeing education for all is a challenge for the whole of society and a right of the citizen" [6].

This right was conceived for Brazilians only in 1988 through the promulgation of the Federal Constitution, which praised education as a common right for all citizens, aiming at achieving the full development of Brazilians and preparing them for the effective exercise of citizenship and

due qualification required by the market as set out in Article 205.

The mandatory and gratuitous nature of Brazilian education is also present in the Statute of Children and Adolescents - ECA (Law nº 8.069/90) [7], Constitutional Amendment nº 14 of 1996 [8], Law of Basic Guidelines of National Education - LDB (Law nº 9.394/96) [9] and the National Education Plan - PNE [10] approved in 2001.

The promotion and incentive of education throughout the Brazilian territory is the duty of the State and families, as stated in art. 208 of that Constitution. Thus, it is up to the Brazilian State to provide compulsory and free basic education from 4 to 17 years of age, extending this right to Brazilians who have not had the opportunity to access education in the stipulated age group. From the age of 17, higher education is foreseen on the merit of passing competitions, such educational organization is ratified by [9].

Brazilian education is divided into basic and higher education, where basic education is composed of early childhood education, elementary and high school. Early childhood education lasts for 5 years with 3 years for the day care center and 2 years for the preschool.

Elementary school has a duration of 9 years, divided into initial years (1<sup>st</sup> to 5<sup>th</sup> year) and final years (6<sup>th</sup> to 9<sup>th</sup> year). High school, on the other hand, lasts 3 years, while higher education varies by undergraduate area [6].

The Brazilian Constitution provides in its Article 206 that Brazilian education is based on equal access and permanence at school; freedom in teaching and learning; pluralism of ideas; democratic management of public education in the form of law and guarantee of a quality standard.

After all, it is through education that "the citizen is able to take possession of cognitive and formative standards by which he is more likely to participate in the destinies of his society and collaborate in his transformation" [11].

### 2.2 Competencies and Responsibilities of Each Federated Entity

In order to guarantee the quality standard of Brazilian education, it is organized in a collaborative regime, with the Union being responsible for managing the federal education system, financing federal public institutions and ensuring equalization of educational opportunities, as well as minimum standard of quality of education to the States, Federal District and Municipalities guaranteeing them technical and financial assistance [1].

The states and the Federal District act as promoters of primary and secondary education. The municipalities, in turn, work in early childhood and elementary education, ensuring universal access and access to compulsory education for Brazilian citizens as stated in the Federal Constitution of 1988.

In order to guarantee the free, maintenance and development of Brazilian education, it is necessary that the Federal Government invest a minimum of 18% of its tax revenues annually on the states, the Federal District and the municipalities 25% [1].

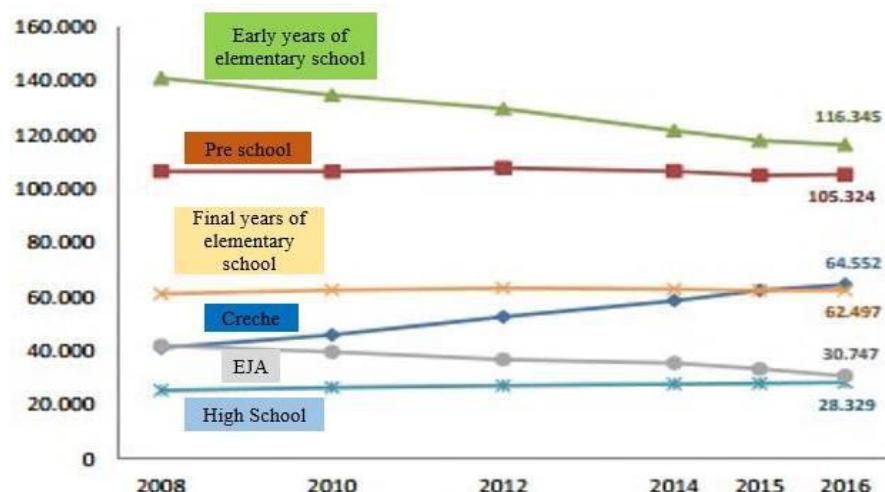
The rates referring to the Union, states, Federal District and municipalities are levied on the net revenue from taxes, that is, the Union must deduct from the gross tax revenue the portion to be transferred to the states, Federal District and municipalities according to [12].

States, on the other hand, must deduct the portion transferred to municipalities from gross revenue from taxes and transfers. Finally, when it comes to the Federal District and the municipalities, the 25% rate will be levied

on all tax revenue (own and transferred) as stated [6].

Brazil has 186 thousand basic education schools, of which 114,7 thousand (61,7%) of which are under the responsibility of the municipalities, 30,6 thousand (16,5%) of the states, 744 (0,4%) of the Union and 39,9 thousand (21,5%) are private, that is, 61,7% of basic Brazilian education is provided by Brazilian municipalities, with 66,1% of schools in urban areas, according to [13]. Which points out that in the last eight years (2008-2016) there had been an increase of 56,9% in the number of schools offering daycare centers and 11,6% in the offer of secondary education in the country.

Fig. 1 shows the evolution in the number of Brazilian schools from 2008 to 2016, highlighting the decrease of 16,89% in schools offering the initial years of elementary school and the 5,32% increase in preschools, 7,59% in schools offering the final years of elementary school and 41,65% of high school. The increase in the number of schools in Brazil ratifies the main axis related to the PNE, the universalization of Brazilian basic education.



*Fig.1: Evolution in the number of schools in Brazil from 2008 to 2016*

Source: INEP (2017)

Brazil has 64.500 daycare centers, according to [13], of which 76,6% are located in urban areas and 58,8% are municipal. In rural areas, daycare centers are the responsibility of 97,4% of municipalities. 105,3 thousand units are destined to preschoolers of Brazilians, located 57,4% in the urban perimeters and the majority of the municipalities are competent (72,8%).

In order to sustain and maintain the current education in the country, the Brazilian government invests 5,5% of GDP in basic and higher education [14] allocating increasing amounts in human and budgetary resources in

conventional education, as well as facing effectively the serious problem of low average schooling and illiteracy among the population aged 15 and over [15], [16].

The increasing allocation of resources comes from the idea, according to the authors, that a high level of education of the population generates competitive advantage for the country, prominence in the face of globalization and assistance in technological development. For [2], high schooling generates economic development, improving democracy and citizenship as well as reducing crime in a country.

### 2.3 Public Investment in Education (2000 to 2015)

According to [14], Brazil allocates higher percentages to education than many developed countries.

However, when it is analyzed in terms of the level of education, there is a large investment by the government in education in the last 15 years.

Table 1 contains information, disaggregated by level of education, regarding the percentage of Total Public

Investment in Education in Relation to the Gross Domestic Product - GDP (per student) for Brazil, between 2000 and 2015 [13].

According to Table 1, public direct investment to students increased at all levels of education from 2000 to 2015. In turn, basic education grew 196,24%, with greater investment in students enrolled in high school, with 2.078 BRL invested in 2000 and 6.637 BRL per student, a 219,39% change in public direct investment to the student.

*Table.1: Public Direct Investment per Student*

Year	All Levels of Education	Public Direct Investment per Student 1,00 BRL					
		Basic education	Child education	Teaching Levels		High school	College education
				Teaching Fundamental	Years Initials		
2000	<b>2.587</b>	2.154	2.717	2.065	2.163	2.078	23.619
2001	<b>2.674</b>	2.229	2.424	2.042	2.357	2.337	23.339
2002	<b>2.653</b>	2.198	2.270	2.406	2.270	1.575	21.615
2003	<b>2.606</b>	2.189	2.588	2.310	2.188	1.746	18.888
2004	<b>2.763</b>	2.363	2.605	2.640	2.440	1.594	17.881
2005	<b>2.943</b>	2.495	2.421	2.829	2.632	1.691	19.267
2006	<b>3.502</b>	3.042	2.646	3.168	3.459	2.350	19.946
2007	<b>4.090</b>	3.562	3.208	3.724	3.931	2.851	21.075
2008	<b>4.629</b>	4.089	3.427	4.291	4.575	3.298	19.480
2009	<b>5.092</b>	4.477	3.432	4.841	5.054	3.477	21.878
2010	<b>5.859</b>	5.151	4.214	5.533	5.545	4.381	23.255
2011	<b>6.408</b>	5.583	4.987	5.727	5.742	5.429	24.778
2012	<b>6.826</b>	6.056	5.880	6.167	5.924	6.178	22.505
2013	<b>7.305</b>	6.471	6.400	6.500	6.429	6.531	25.181
2014	<b>7.380</b>	6.569	6.506	6.542	6.559	6.664	24.209
2015	<b>7.273</b>	6.381	6.443	6.287	6.271	6.637	23.215

*Source: INEP (2017)*

Table 2 shows the investments disaggregated by level of education, regarding the percentage of Total Public Investment in Education in relation to GDP [13], for the period from 2000 to 2015.

This table shows an increase in the percentage of total public investment in education in Brazil in relation to GDP over the period, reaching the lowest value in 2000 (4.6%) and the highest in 2015 (6.2%).

These results corroborate the 20<sup>th</sup> goal of the PNE, which consists of expanding public investment in Brazilian GDP in 2019 and 10% in 2024. In other words, the Brazilian State allocates increasingly higher percentages of its GDP for education, especially basic education.

Spending per student follows the growth of educational level in most countries, according to [14],

spending per student in higher education is 1.9 times higher than with students enrolled in the early years of elementary school. In Brazil, in 2013 the investment was 3.5 times higher.

Altogether (elementary to higher education) USD 5.000 per student was spent in 2013 in Brazil, USD 3.800 of which went to basic education, while for each educational level OECD member countries invest, on average, USD 8,4 thousand / student in the initial years of study, USD 9,9 thousand / student in the final years and USD 9,8 thousand / student in high school, as stated by [14].

Thus, Brazil is one of the countries that spends less on students in basic education when compared to other OECD member countries. However, it presents expenses with students in higher education similar to European

countries, according to the [14], making it necessary to increase the resources destined to basic education,

*Table.2: Percentage of Total Public Investment in Education in relation to GDP, by level of Education - Brazil 2000 - 2015*

Year	All Levels of Education	Percentage of Total Public Investment in relation to GDP (%)					
		Teaching Levels				High school	College education
		Teaching Fundamental		Years Initials	Years Finals		
Years	Basic education	Child education					
2000	<b>4,6</b>	3,7	0,4	1,5	1,2	0,6	0,9
2001	<b>4,7</b>	3,8	0,4	1,4	1,3	0,7	0,9
2002	<b>4,7</b>	3,8	0,3	1,6	1,3	0,5	0,9
2003	<b>4,6</b>	3,7	0,4	1,5	1,2	0,6	0,9
2004	<b>4,5</b>	3,7	0,4	1,5	1,2	0,5	0,8
2005	<b>4,5</b>	3,6	0,4	1,5	1,2	0,5	0,9
2006	<b>4,9</b>	4,1	0,4	1,6	1,5	0,6	0,8
2007	<b>5,1</b>	4,2	0,4	1,6	1,5	0,7	0,9
2008	<b>5,3</b>	4,4	0,4	1,7	1,6	0,7	0,9
2009	<b>5,6</b>	4,7	0,4	1,8	1,7	0,8	0,9
2010	<b>5,6</b>	4,7	0,4	1,8	1,7	0,8	0,9
2011	<b>5,8</b>	4,8	0,5	1,7	1,6	1,0	1,0
2012	<b>5,9</b>	4,9	0,6	1,7	1,5	1,1	1,0
2013	<b>6,0</b>	4,9	0,6	1,6	1,5	1,1	1,1
2014	<b>6,0</b>	4,9	0,7	1,6	1,5	1,1	1,1
2015	<b>6,2</b>	4,9	0,7	1,6	1,4	1,1	1,3

Source: INEP (2017)

#### 2.4 Efficiency and the Quality of Brazilian Educational Resources

Efficiency had been included as one of the fundamental principles of public administration, through Constitutional Amendment 19 of 1998, at the time of transition from traditional public administration with bureaucracy to an administration more focused on results and on the cost / benefit ratio starting in Brazil the so-called managerial administration [17], [18].

Since then, studies aimed at assessing the efficiency of Brazilian public spending have become more recurrent, especially aimed at the efficiency of educational resources, after all, according to [19] it is through education that individual gains are generated, which in turn contribute to increased productivity by raising a nation's economic level.

The first work to address this issue was done in the United States in 1966, through the Equality of Educational Opportunity report prepared by James Coleman [15]. In Brazil, the works of [2], [16], [20], [21],

[22], [23], [24], [25], [26], [27], [28], stand out for addressing the efficiency of public spending on education at the national and regional level.

[2] analyzed the determinants of quality in Brazilian education in 2,837 municipalities in the period 1997, 1999, 2001, 2003 and 2005, noting that there was an improvement in the quality of education in the period analyzed.

For [28], the efficiency of public spending on fundamental education in Brazil in 2011 was inefficient, thus requiring improvements in the management of resources used for education. In turn, [20], ratify the inefficiency of public spending by Brazilian states on education, at the fundamental and medium level in 2003

The efficiency of resources allocated to education in Minas Gerais state in 2004 was not effective [23], [21] pointed out that the municipalities in Minas Gerais state with the lowest per capita expenditure on education presented more efficient results, a conclusion also found

by [22].

In Paraná state, in the period from 2005 to 2009, spending on education proved to be inefficient, with the need for a review by the public administration of the way in which such spending is used [24]. For [26], the most efficient municipalities in Paraná are those with less than 30 thousand inhabitants, but improvements in resource management are still necessary.

In studies carried out in northeastern Brazil, [25] affirms an increase in the inefficiency of Paraíba municipalities from 2007 to 2009. For [16], there was no difference in the inefficiency of spending on education in the cities of Goiás in the period 2005-2009.

The studies analyzed at national and regional level summarize that "to obtain a quality education, the simple application of resources is not enough, it is necessary that they are used in an effective and effective way" [27], making efficient resource allocation essential to ensure quality and equity in education.

### III. RESEARCH METHOD

The study can be classified as a research of descriptive analysis, because it seeks to register and analyze phenomena, without the interference of the researcher, being limited to discovering how often a given phenomenon happens, or how a system, method, operational process or reality [29], [30].

As for the approach, this research is characterized as for the collection and treatment of data, as well as quantitative, as it uses techniques and statistical resources analyzes relationships between variables, establishing patterns of behavior [31], [32].

Data on the total expenditure per capita of 5145 Brazilian municipalities in the period 2005-2013 were collected from the National Treasury Secretariat - STN, in order to estimate the relationship between total municipal expenditure per capita in the results from the FIRJAN [33] Index of Municipal Development - IFDM- Education.

The IFDM is a study carried out annually by the FIRJAN System in order to monitor the socioeconomic development of all Brazilian municipalities in the areas of Employment and Income, Education and Health to see if there had been an improvement in the policies adopted by the municipalities [33].

The index, in turn, varies from 0 to 1, subdivided into the classification categories: low (0 to 0,4), regular (0,4 to 0,6), moderate (0,6 to 0,8) and high (0,8 to 1), that is, the closer to score 1, the greater the development of the

locality in the analyzed area [33].

To estimate this relationship, we used the Multiple Linear Regression statistical model, with data stacked in the form of a panel and estimated by Ordinary Least Squares - OLS. Thus, it aims to obtain a mathematical function capable of describing the behavior of a given variable in relation to one or more independent variables [34].

The Multiple Linear Regression model with panel-stacked data is able to aggregate a combination of time series with cross-sectional units. Thus, the total analysis data corresponds to the cross-sectional observations multiplied by t time periods. This allows for a deeper analysis of the data, as there is more generation of information when compared to the use of only the cross section or time series [35], [36].

For these authors, the stacked data considers the specific individual variables, decreases collinearity and allows the study of more complex models such as studies focused on the dynamics of change. In this way, an empirical analysis is enriched.

Using the mentioned technique and the context of this study, the following Multiple Linear Regression equation with stacked data is proposed for analysis:

$$IFDM_Education_{it} = \alpha + \beta \ln spendin g_{it} + \mu_n \sum_{n=1}^5 RE G_n \ln spendin g_{it} + \varphi_t \sum_{t=1}^8 D_t + \varepsilon_{it}$$

Where:

- IFDM\_Education<sub>it</sub> corresponds to the IFDM values of the municipalities *i* in the year *t*
- expenditures<sub>it</sub> are the values of municipal spending *i* in the year *t*
- REG<sub>n</sub> is a set of dummy variables with a value of 1 for each of the 5 Brazilian regions
- D<sub>t</sub> is a set of dummy variables for the years
- α, β, μ and φ are the estimated coefficients
- ε<sub>it</sub> is the term of random error.

The software STATA 11.0 Statistics / Data Analysis Special Edition was used in order to estimate the coefficients and ascertain the existence of a relationship

### IV. RESULTS AND DISCUSSIONS

#### 4.1 Overview of Brazilian Education

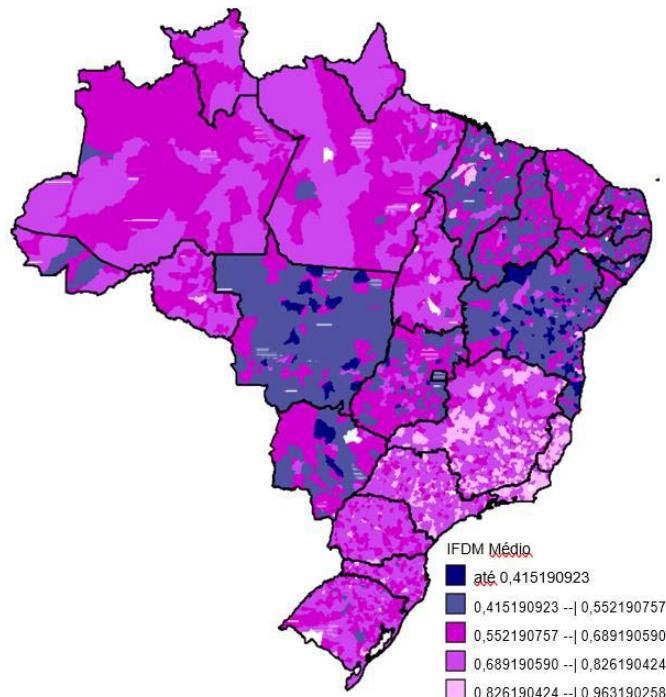
Fig.2 illustrates information about the average IFDM of the Brazilian municipalities analyzed, where the darkest

areas on the map correspond to the lowest scores, while the lightest ones correspond to the highest and therefore the best scores. The blank parts of the map refer to municipalities that do not have an IFDM score due to lack of data in the years analyzed. Among the studied variables. In order to statistically validate the coefficients, he performed a t test, which, as recommended by [37], checks the null hypothesis of the absence of statistical significance for each individual coefficient.

The general significance of the model is assessed using the f test, which according to the aforementioned authors corresponds to the values of probability associated with the

test ( $\text{Prob} > F$ ). There is the possibility of verifying whether the independent variables used are able to explain the variations in the IFDM - Education by means of Adjusted  $R^2$ , which corresponds to the degree of adjustment of the observed data regression line, as stated by the authors.

The Brazilian Northeast, in particular Bahia, Alagoas, Maranhão and Piauí along with the Midwest region, with highlighting on Mato Grosso, Mato Grosso do Sul and the Federal District, present a higher incidence of average IFDM of up to 0.56, thus characterizing a performance these regions in the IFDM.



*Fig.2: Map of the Average IFDM from 2005 to 2013*

*Source: Own Authorship through DATASUS software (2018)*

Proof of this is that in 2005 the 10 worst Brazilian municipalities in education were from the Northeast, 9 of them from Bahia and 1 from Alagoas. As of 2006, municipalities of Amazonas, Pará and Acre entered the ranking, from which on Bagre – PA could be highlighted, which in 2007, 2008, 2010 and 2011 was the worst municipality in Brazil in terms of education according to the IFDM, with an index of: 0.1930; 0.1805, 0.2469 and 0.2737.

In 2007, 7 of the worst municipalities in education remained those in the Northeast, a fact that was repeated in the following year and worsened in 2009, which again reached 9 municipalities among the 10 worst in education. In 2010, the Northeast had 5 municipalities in the ranking

reaching the best mark in 2013 with only 4 municipalities (Ouro Branco - AL, Ibicuí - BA, Jucuruçu - BA and Santa Luzia - BA).

Over the course of the period of study, the São Paulo municipalities stood out among the top 10 in the IFDM score, with the exception of 2007 when the municipality of Chapadão do Céu – GO occupied the 10<sup>th</sup> position with 0.9272.

In 2010, the municipality of Fernão - SP reached the maximum score 1 in the IFDM, which was also achieved by the São Paulo municipalities of Borá, Gabriel Marques, Marinópolis in 2011; Álvares Florence, Borá, Gabriel Marques, Nova Castilho and Tourmaline in 2012; and Floreal, Turmalina, Taguaí and Santa Salete in 2013.

Fernão stands out for being the first to reach maximum score and Borá, Gabriel Marques and Turmalina for reaching maximum score in more than a year.

The disparities found in the Brazilian regions portray the existing “two Brazils”, which for [33] are divided into South and Southeast on one side and on the other North and Northeast.

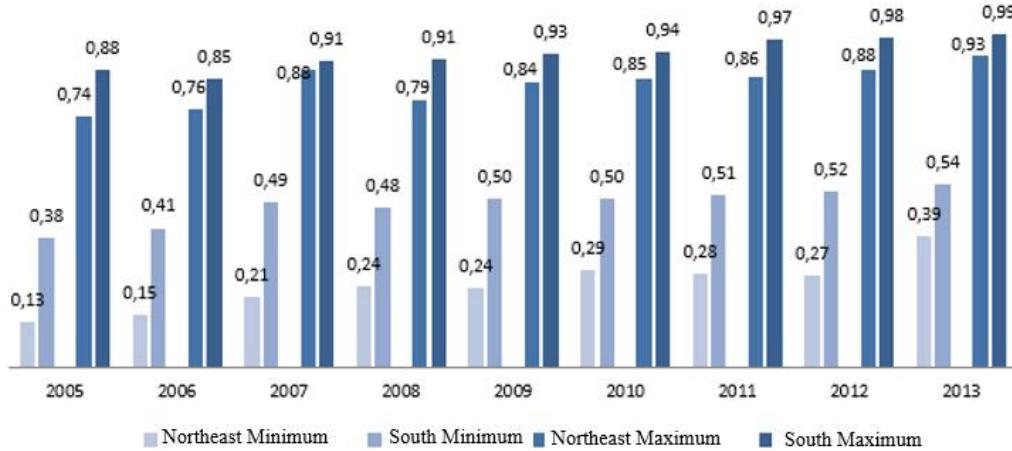


Fig.3: Maximum and Minimum IFDM of the Northeast and South (2005 - 2013)

Source: Adapted from FIRJAN (2015)

In 2005, the South had its lowest score in the IFDM (0,3817). However, it was still 287,64% higher than the Northeast score achieved, which in 2013 assumed a higher value (0,9255), being 106,87% lower than the South score (0,9891).

The wide difference between IFDM scores reaffirms the inequalities between Brazilian regions, providing a picture of the dimension of [...] the great disparity that still persists in terms of development [33]. For [33], the municipalities with the worst IFDM in 2005 will take 13 years to reach the development standards of the with outstanding municipalities in 2011.

Thus, the expenditures committed in the educational area by each municipality were analyzed together with the score obtained in the IFDM - Education in order to ascertain whether, with the average increase in spending, there was an increase in the score of the IFDM- Education, which corresponds to an increase in the level of Brazilian education.

Fig.4 shows the evolution of spending committed to education and the average score in the IFDM in the years 2005 to 2013, highlighting whether Brazilian children, youth and adolescents received a quality public education through committed spending.

Thus, the minimum and maximum values of the scores of the South and Northeast region found in figure 3 that praise this division through the score reached by the municipalities in the region with the best performance (South) with the worst performance (Northeast) in the IFDM - Education.

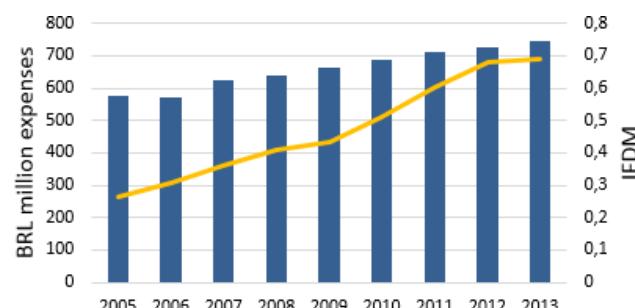


Fig.4: Average evolution of spending and IFDM

from 2005 to 2013

Source: Own Authorship (2018)

IFDM has grown since the beginning of the historical series analyzed. It varies by 3,4% per year, reaching the

#### 4.2 Education Spending by Brazilian Region

In order to investigate the social performance of the municipalities from 2005 to 2013, especially in education, Stata software was used to analyze the coefficients, robust standard error and significance of each of the variables studied (Table 03), as well as to eliminate possible influences among variables. The South region was the control variable for the model used in this research, which lowest score in 2006 (0,572 points) and the highest in 2013 (0,746 points). However, for [33] “the indicators that make

up the IFDM Education remain far from the goals defined in [10].

Namely, the IFDM has as indicators, the age-grade distortion rate, percentage of teachers with higher education, average daily number of class hours, drop-out rate and the basic education development index - IDEB.

It was only in 2006 that there had been a 4,92% decrease in IFDM compared to the previous year, in the other years only an increase. Regarding spending, in 2006 there was also a decrease of 5,52% compared to the previous year, which in no way detracts from the unique moment experienced by the Brazilian economy from 2005 to 2013, as the GDP increased 35%, there was the generation of formal jobs and 28% increase in average

*Table.3: Multiple Regression Model Results*

IFDM	Coeficientes	Erro Padrão Robusto	P >  t
<b>Ln gastos</b>	0,3145	0,0010	0,0000
<b>Ln Gastos Norte</b>	-0,0287	0,0003	0,0000
<b>Ln Gastos Nordeste</b>	-0,0303	0,0002	0,0000
<b>Ln Gastos Centro-Oeste</b>	-0,0085	0,0003	0,0000
<b>Ln Gastos Sudeste</b>	0,0077	0,0002	0,0000
<b>Constante</b>	0,4575	0,0061	0,0000

**Número de Observações: 48.222 (2005-2013)**  
**Prob> |F|: 0,0000**  
**R<sup>2</sup> Ajustado: 0,6162**

*Source: Own Authorship (2018)*

Over the years analyzed, there was an evolution of the increase in spending on Brazilian education, favoring, in general, improvements in the results in the IFDM - Education of the municipalities.

The Southeast region showed an average increase in the IFDM score, in which for every 1% in the variation of municipal spending in this region, an average increase of 0,0077 is estimated in its score scale.

The other Brazilian regions showed an average decrease in IFDM for each variation of 1% in their spending. The North region showed an average decrease of 0,0287, while the Northeast of 0,0303 and the Midwest of 0,0085, that is, the region that presented the greatest decrease in the IFDM score in the period analyzed outside the Northeast region.

The increase in education spending in Brazil as a whole positively influenced the IFDM by increasing it over the years analyzed. However, when analyzed regionally only in the South and Southeast, it showed growth, as in the Midwest, North and Northeast, it decreased, emphasizing that spending in these regions increased, but there was no increase in the IFDM score.

income [33].

For [33], such an environment was conducive to the increase in the collection of taxes destined to the financing of public policies, either through its own collection or through transfers, thus causing greater social action on the part of governments was chosen at random by the software.

The model as a whole and the variables used (education expenditures in each Brazilian region) were statistically significant, indicating that 61.62% of the variations that occurred in the IFDM-Education were explained by the variations in spending, of the 48.222 observations made.

*Table.3: Multiple Regression Model Results*

The results obtained showed that the Brazilian region whose spending contributes most to the quality of education is the South, followed by the Southeast, Midwest, North and Northeast.

Thus, it is necessary that efforts aimed at education in the North and Northeast of the country intensify even more in order to unite Brazil in one, so that Brazilians, regardless of the region they reside in, have access to education basic quality the same way those living in the state of São Paulo have.

These results confirm the findings of [2], who highlights the improvement in the quality of Brazilian education as a whole. However, when analyzed regionally, this panorama changes, as pointed out by [28],

[25] and [20], who state that education spending has increased, but that the management of these resources is not efficient at the municipal level impacting the quality of education.

## V. CONCLUSION

The study verified the influence of municipal expenditures on the quality of Brazilian basic education, concluding through the applied statistical model, that the variables used (total expenditures per capita) of 5145 Brazilian municipalities in the period from 2005 to 2013 would significantly influence the score of municipalities in IFDM- Education, explaining 61.62% of the variations occurred in IFDM at a confidence level of 99%.

Throughout the analyzed period, it was concluded that the committed expenditures increased, which favored the results in the IFDM-Education of the municipalities, therefore they must be continuously and efficiently managed in order to guarantee quality education from North to South of the country. This did not happen in the analyzed period, since the North and Northeast regions showed less efficiency in these expenses, causing an average decrease in the IFDM score.

It is worth noting that other factors can influence the efficiency of spending committed to education and, in turn, cause reflections on the quality of municipal education offered. Examples could be the high number of students in the public system, high dropout and repetition rate as well as school infrastructure.

Thus, it is suggested to improve the quality of education macroeconomic policies that aim at fiscal balance and efficient management of public resources, especially resources in the North and Northeast so that municipalities can increase in the level of IFDM thus allowing an improvement in the level of development allowing Brazilians to have their needs met.

It also stresses the need to implement policies aimed at maintaining and developing Brazilian basic education, constantly expanding and improving the schools offering public education and student assistance programs, such as psychosocial support.

Finally, it is proposed as a suggestion for future research the in-depth study of the municipalities that stood out positively in the IFDM-Education even though they are located in regions that did not present satisfactory results.

In addition, it is suggested to analyze the nine São Paulo municipalities that obtained higher scores in the IFDM, as a way to assess the way resources are managed and, then, to identify the bottlenecks and potentials for an efficient and quality education in Brazil

## REFERENCES

- [1] BRAZIL. (1988). *Federal Constitution of 1988*. Promulgated on October 5, 1988. Retrieved from: [https://www.senado.gov.br/atividade/const/con1988/con1988\\_08.09.2016/art\\_205\\_.asp](https://www.senado.gov.br/atividade/const/con1988/con1988_08.09.2016/art_205_.asp)
- [2] FRANCO, A.M.P. (2008). *The determinants of the quality of education in Brazil*. Thesis of Doctorate. University of São Paulo. Retrieved from: <http://www.teses.usp.br/teses/disponiveis/12/12138/tde-27032009-100849/pt-br.php>
- [3] CARVALHO, R.E. (2012). *Removing barriers to learning*.
- [4] FREIRE, P. (2000). *Pedagogy of indignation: pedagogical letters and other writings*.
- [5] UN. (1948) *Universal Declaration of Human Rights of 10 December 1948*. Retrieved from: <http://www.onu.org.br/img/2014/09/DUDH.pdf>
- [6] BRAZIL. (2006). *School Council and the financing of Education in Brazil*.
- [7] BRAZIL. (1990). *Law N°. 8,609, of July 13, 1990*. Retrieved from: [http://www.planalto.gov.br/ccivil\\_03/leis/L8069.htm](http://www.planalto.gov.br/ccivil_03/leis/L8069.htm)
- [8] BRAZIL. (1996). *Constitutional Amendment N°. 14, of September 12, 1996*. Retrieved from: [http://www.planalto.gov.br/ccivil\\_03/constituicao/endas/emc/emc14.htm](http://www.planalto.gov.br/ccivil_03/constituicao/endas/emc/emc14.htm)
- [9] BRAZIL. (1996). *Law N°. 9394, of December 20, 1996*. Retrieved from: [www.planalto.gov.br/ccivil\\_03/leis/L9394.htm](http://www.planalto.gov.br/ccivil_03/leis/L9394.htm)
- [10] BRAZIL. (200?). *National Education Plan: Reasons, Principles and Programs*.
- [11] CURY, C.R. (2005). *The right to education: A field of action of the educational manager at school*.
- [12] BRAZIL. (2006). *Law N°. 11.274, of February 6, 2006*.
- [13] INEP -National Institute of Educational Studies and Research Anísio Teixeira. (2017) *Basic Education School Census 2016: Statistical Notes*. Retrieved from: [http://download.inep.gov.br/educacao\\_basica/censo\\_escolar/notas\\_estatisticas/2017/notas\\_estatisticas\\_censo\\_escolar\\_da\\_educacao\\_basica\\_2016.pdf](http://download.inep.gov.br/educacao_basica/censo_escolar/notas_estatisticas/2017/notas_estatisticas_censo_escolar_da_educacao_basica_2016.pdf)
- [14] OECD - Organization for Economic Cooperation and Development. (2016). *Education at a Glance 2016: OECD Indicators*.
- [15] DIAZ, M.D.M. (2012). *Quality of municipal public spending on elementary education in Brazil*. Political Economy Magazine, v.32, n.1 (126), pp. 128-141. Retrieved from: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0101-31572012000100008](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0101-31572012000100008)
- [16] PEÑA, C.R., ALBUQUERQUE, P.H.M., & CARVALHO, J.M. *The efficiency of public spending on education: georeferenced evidence in municipalities in Goiás*. Applied Economics, v. 16, n. 3, 2012, pp. 421-443. Retrieved from: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S1413-80502012000300004](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1413-80502012000300004)
- [17] ALEXANDRINO, M., PAULO, V. (2013) *Uncomplicated administrative law*.
- [18] PALUDO, A.V. (2012). *Public administration*.
- [19] VASCONCELLOS, C. (2005). Evaluation: liberating dialectical conception of the school evaluation process.

- [20] ZOGHBI, A. C. P., MATOS, E. H. C. de, ROCHA, F. F. & ARVATE, P. R. *Measuring the performance and efficiency of state spending on primary and secondary education.* Economic Studies, vol. 39, n. 4, pp. 785-809. Retrieved from: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0101-41612009000400004](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0101-41612009000400004)
- [21] BAPTISTELLI, P. M. F. B. (2009). *Quality of public spending in Minas Gerais municipalities in the area of education.* Thesis of Master. Integrated Faculties Pedro Leopoldo. Retrieved from: [http://www.fpl.edu.br/2013/media/pdfs/mestrado/dissertacoes\\_2009/dissertacao\\_patrica\\_maria\\_2009.pdf](http://www.fpl.edu.br/2013/media/pdfs/mestrado/dissertacoes_2009/dissertacao_patrica_maria_2009.pdf)
- [22] MORAIS, R.C. de. (2009). *Efficiency of public spending on basic education in Minas Gerais prefectures: an approach via data envelopment analysis.* Thesis of Master. Paulo Neves de Carvalho School of Government. Retrieved from: <http://www.repositorio.fjp.mg.gov.br/handle/123456789/175>
- [23] SILVA, A. de A.P; et al. (2012) *Efficiency in the Allocation of Public Resources for Education, Health and Housing in Minas Gerais Municipalities.* Accounting, Management and Governance, v.15, n.1, pp.96-114. Retrieved from: [http://repositorio.ufop.br/bitstream/123456789/1651/1/ARTIGO\\_Efici%C3%A3nciaAloca%C3%A7%C3%A3oRecursos.pdf](http://repositorio.ufop.br/bitstream/123456789/1651/1/ARTIGO_Efici%C3%A3nciaAloca%C3%A7%C3%A3oRecursos.pdf)
- [24] SAVIAN, M.P.G, BEZERRA, F.M. (2013). *Efficiency analysis of public spending on education in elementary education in the state of Paraná.* Economy & Region, v.1, n.1, p.26-47. Retrieved from:<http://www.uel.br/revistas/uel/index.php/ecoreg/article/view/12963>
- [25] FIRMINO, R.G. (2013) *Evaluation of efficiency in the application of public resources for basic education: a study in the municipalities of Paraíba.* Thesis of Master. University of Brasilia, Federal University of Paraíba and Federal & University of Rio Grande do Norte. Retrieved from: [http://www.repositorio.unb.br/bitstream/10482/13113/1/2013\\_RafaelleGomesFirmino.pdf](http://www.repositorio.unb.br/bitstream/10482/13113/1/2013_RafaelleGomesFirmino.pdf)
- [26] MACÊDO, F.F.R.R; et al. (2015) *Analysis of the efficiency of public resources directed to education: study in the municipalities of the State of Paraná.* Retrieved from: Public Administration and Social Management. v.7, n.2, pp.54-62. Retrieved from: <https://periodicos.ufv.br/apgs/article/view/4614>
- [27] SANTOS, Y.D. From; CARVALHO, J.R.M de; BARBOSA. M.F.N. *Analysis of Efficiency of spending on education in elementary education in the municipalities of Seridó Potiguar.* Accounting Environment Magazine, v.8, n.2, pp.298-308. Retrieved from: <https://periodicos.ufrn.br/ambiente/article/view/7363/6405>
- [28] BEGNINI, S; TOSTA, H.T. *The efficiency of public spending on basic education in Brazil: an application of data envelopment analysis -DEA.* (2017). Economics and Management, v.17, n.46, 2017, pp. 43-59. Retrieved from: <http://periodicos.pucminas.br/index.php/economiaege>
- stao/article/view/P.1984-6606.2017v17n46p43/12048
- [29] GIL, A.C. (2002). *How to develop research projects.*
- [30] JUNG, C.F. (2004) *Methodology for research & development: applied to new technology, products and processes.*
- [31] CRESWELL, J. W. (2010). *Research project: quantitative, qualitative and mixed methods.*
- [32] SAMPIERI, R. H., COLLADO, C.F. & LUCIO, P.B. (2006). *Research methodology.*
- [33] IFDM - FIRJAN for Municipal Development Index. (201?). Retrieved from: <http://www.firjan.com.br/ifdm/consultao-indice/>
- [34] CORRAR, L.J., PAULO, E. & FILHO, J.M.D. *Multivariate analysis for administration, accounting and economics courses.* (2014)
- [35] BALTAGI, B. H. *Econometrics analysis of panel data.* (2001).
- [36] HSIAO, C. *Analysis of panel data.* (2003).
- [37] CORRAR, L.J., THEÓPHILO, C.R. *Pesquisa Operacional para Decisão em Contabilidade e Administração.* (2013).